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Technical Report **R 363**

EVALUATION OF PAINT SYSTEMS FOR USE IN RADIOISOTOPE LABORATORIES

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U. S. NAVAL CIVIL ENGINEERING LABORATORY
Port Hueneme, California

EVALUATION OF PAINT SYSTEMS FOR USE IN RADIOISOTOPE LABORATORIES

Y-F015-06-06-902

Type B

by

J. B. Crilly and S. H. Bassett

ABSTRACT

Two paints, one based on epoxy resin and the other a strippable coating, were tested on concrete and on wood and compared to bare stainless steel for ease of cleaning of radioactive contaminants. It was found that the epoxy paint, Plasite 7122, provides a surface that can be easily decontaminated. This paint is in routine use at the Atomic Energy Commission's Los Alamos Scientific Laboratory, where it is employed to coat surfaces that are routinely exposed to radioactive contamination, and has been found to provide a readily cleanable surface.

The strippable coating, Fuller's Stripcoat, intended to be removed and replaced when contaminated, was effective for aqueous contaminant solutions but was ineffective for oily contaminants, which dissolved and penetrated the coating.

INTRODUCTION

To resist contamination, the surfaces of materials of construction should be smooth and unbroken, chemically inert, nonabsorbent, and hydrophobic.[1] Of the materials, wood, concrete, and stainless steel, only stainless steel can be considered to possess these characteristics. Wood and concrete can be made to present such surface characteristics if coated with a paint which provides a contamination-resistant surface.

Mechanisms by which a radioactive species becomes affixed so as to contaminate a material are similar to those by which similar, nonradioactive substances adhere under like conditions.[2] Coatings which are known to be chemically resistant to reagents are suitable prospects for testing for resistance to their radioactive counterparts. In this investigation the coatings tested were any epoxy-resin-based paint and a strippable coating. The paint was considered to be a permanent surface for the base material; the strippable coating was to be removed and replaced when contaminated. The epoxy coating was applied to concrete and to wood, while the strippable coating was applied to painted wood only. They were compared to bare stainless steel for resistance to contamination and ease of decontamination. The results are supplemented by the results of other experimenters and evaluated in light of experience with the epoxy coating at the Los Alamos Scientific Laboratory.

TEST PROCEDURE

The epoxy coating selected by the Bureau of Yards and Docks for evaluation was Plasite 7122, a product of the Wisconsin Coating Corporation, Green Bay, Wisconsin. The strippable coating was Fuller's Stripcoat, supplied by the W. P. Fuller Company, San Francisco, California.

Ten 2 x 6 x 16-inch segments of concrete blocks were undercoated with a fill coat of Plasite 9028 and topcoated with Plasite 7122. Ten 1/4 x 6 x 16-inch plywood panels were coated with Plasite 7122, and ten others were undercoated with enamel conforming to Federal Specification TT-E-489, a medium oil-alkyd resin paint, and overcoated with the Fuller's Stripcoat. Ten 1/8 x 6 x 16-inch unpainted stainless steel panels were used for the comparison.

The contaminants used were radioactive phosphorus in tri-n-butyl phosphate, and "aged mixed fission products," which constitute an aqueous solution of such isotopes as zirconium-93, cesium-135, cesium-137, and cerium-144 obtained from fission of uranium-235. The tri-n-butyl phosphate was used to test the effects of an oily substance on the test surfaces; the aged mixed fission products were used to test the effects of aqueous solutions.

An 80-microliter increment of contaminant preparation was spotted on the test panel and allowed to stand 15 minutes prior to initial measurement. Measurement of radioactivity was made in triplicate with a Geiger-Mueller detector positioned in a lead brick chamber 10 millimeters above the contaminated surface. The panel was then scrubbed ten times with a paper towel soaked in an aqueous solution of "Tide," a commercial detergent, then rinsed and dried with paper toweling and remeasured for radioactive contamination. This procedure was repeated for 30 additional scrubbings, and again for 40 additional scrubbings. If the panel still showed significant radioactive contamination, it was scrubbed ten times with moistened "Comet," a commercial household cleanser, applied with a paper towel, followed by rinsing, drying, and remeasuring. Two cycles of 20 and then 30 additional cleanser scrubbings were made, and a final measurement was taken.

TEST RESULTS

The data presented in Tables I through IV have been corrected for radioactive decay, instrument resolution, and background activity as described in the Appendix. Average values obtained from triplicate runs are presented in the form of bar graphs, Figures 1 and 2.

The stainless steel, Table I, was almost completely resistant to the oily tri-n-butyl phosphate; the first washing reduced its radioactivity to approximately the background count rate of 34 counts per minute. The tri-n-butyl phosphate contamination of the Plasite on concrete, Table II, and Plasite on wood surfaces, Table III, was reduced by the first washing to about 50 times the background measurement. Repeated scrubbing, according to the experimental procedure, resulted in about another sevenfold reduction in contaminant. The Fuller's Stripcoat, Table IV, was soluble in the tri-n-butyl phosphate, which therefore penetrated to the TT-E-489 enamel beneath it. Stripping the panel of its coating failed to remove the test spot. Thus, for tri-n-butyl phosphate, the stainless steel surface is easiest to clean; the Plasite on concrete and Plasite on wood can be cleaned satisfactorily; but the Stripcoat does not leave a clean subsurface when stripped off and is unsatisfactory for this sort of contaminant.

The aqueous solution of aged mixed fission products did not penetrate the Stripcoat, and in this case stripping the panel of its coating successfully removed the test spot. This contaminant on Plasite on concrete was removed by the first

washing to about 30 times background radioactivity, and after the first cleanser scrubbing the measurement was reduced nearly to background level. This contaminant on Plasite on wood was reduced to about 500 times background measurement by the first washing, and repeated scrubbings resulted, finally, in a reduction in contamination to about five times background. The aged mixed fission products adhered so strongly to the stainless steel that a chemical adsorption or an exchange reaction might be suspected. At the end of the scrubbing procedure the contamination was still about 150 times background. Some further reduction to about nine times background, was achieved by soaking 84 hours in a strong solution of a chelating agent, "Versene."

TAKARAZUKA RADIATION LABORATORY RESULTS

Since this work was begun, a report of extensive work on "Radioactive Contamination and Decontamination of Coatings" has appeared.[3] The coatings and surfaces tested, arranged in order of "cleanability," were the following:

Polyurethane
Strippable coating
Acrylic lacquer
Melamine alkyd
Acrylic lacquer containing nitrocellulose
Glass
Nitrocellulose lacquer
Polyvinyl chloride-acetate copolymers
Polyethylene
Silicon resin
Epoxy resin polyamide cured
Alkyd
Aluminum
Stainless steel
Lead

The contaminants used were acidic aqueous solutions of radioactive phosphoric acid, sulfuric acid, sodium iodide, barium chloride, and fission products. Decontaminating solutions were moderately strong acids instead of the mild detergent used in the work at NCEL. The rating system was essentially that of Tompkins and Bizzel,[4] who investigated the susceptibility of some 75 proprietary paints, plastics, and floor coverings to contamination and ease of decontamination.

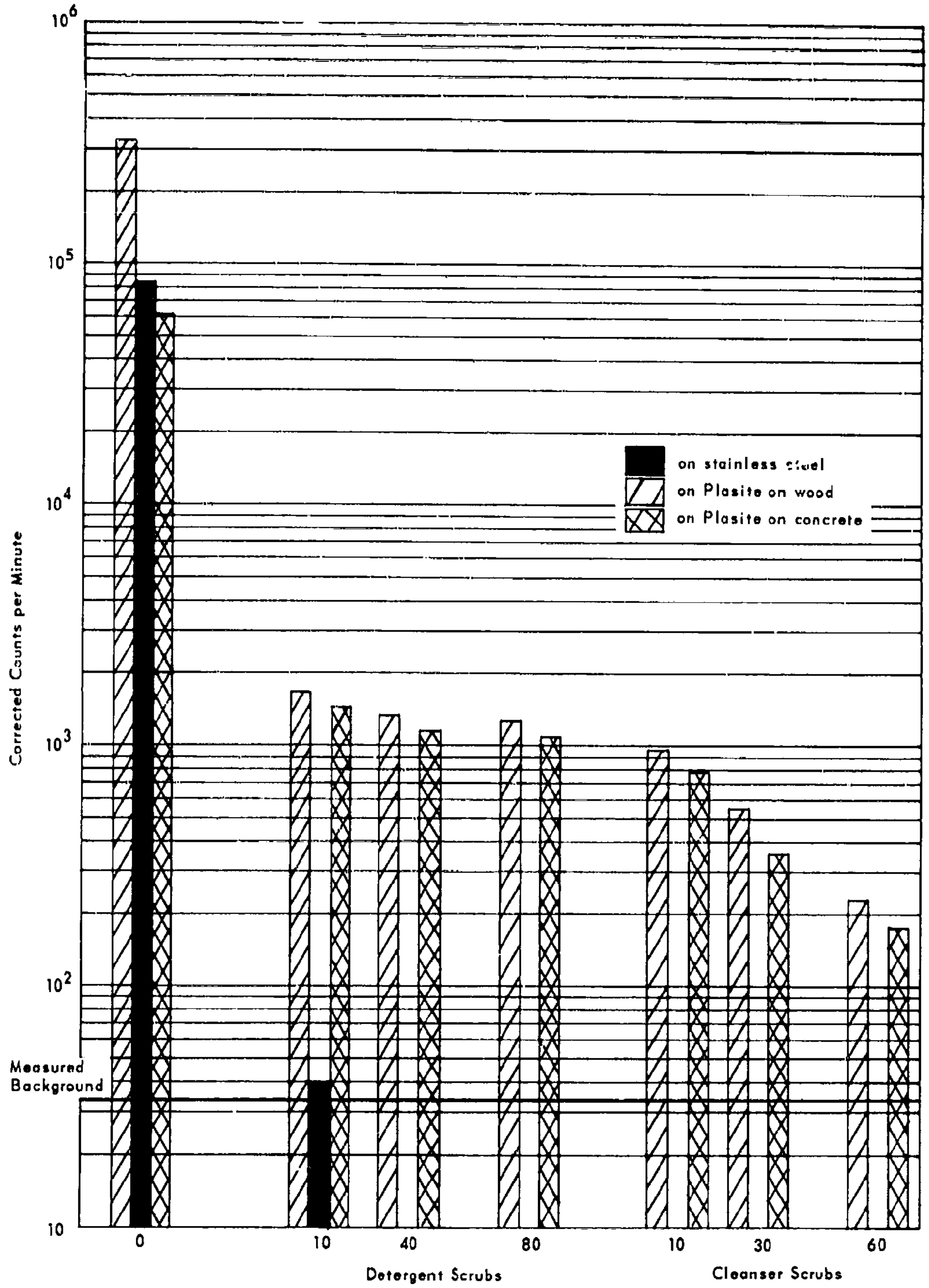

Figure 1. Contamination by tri-n-butyl phosphate.

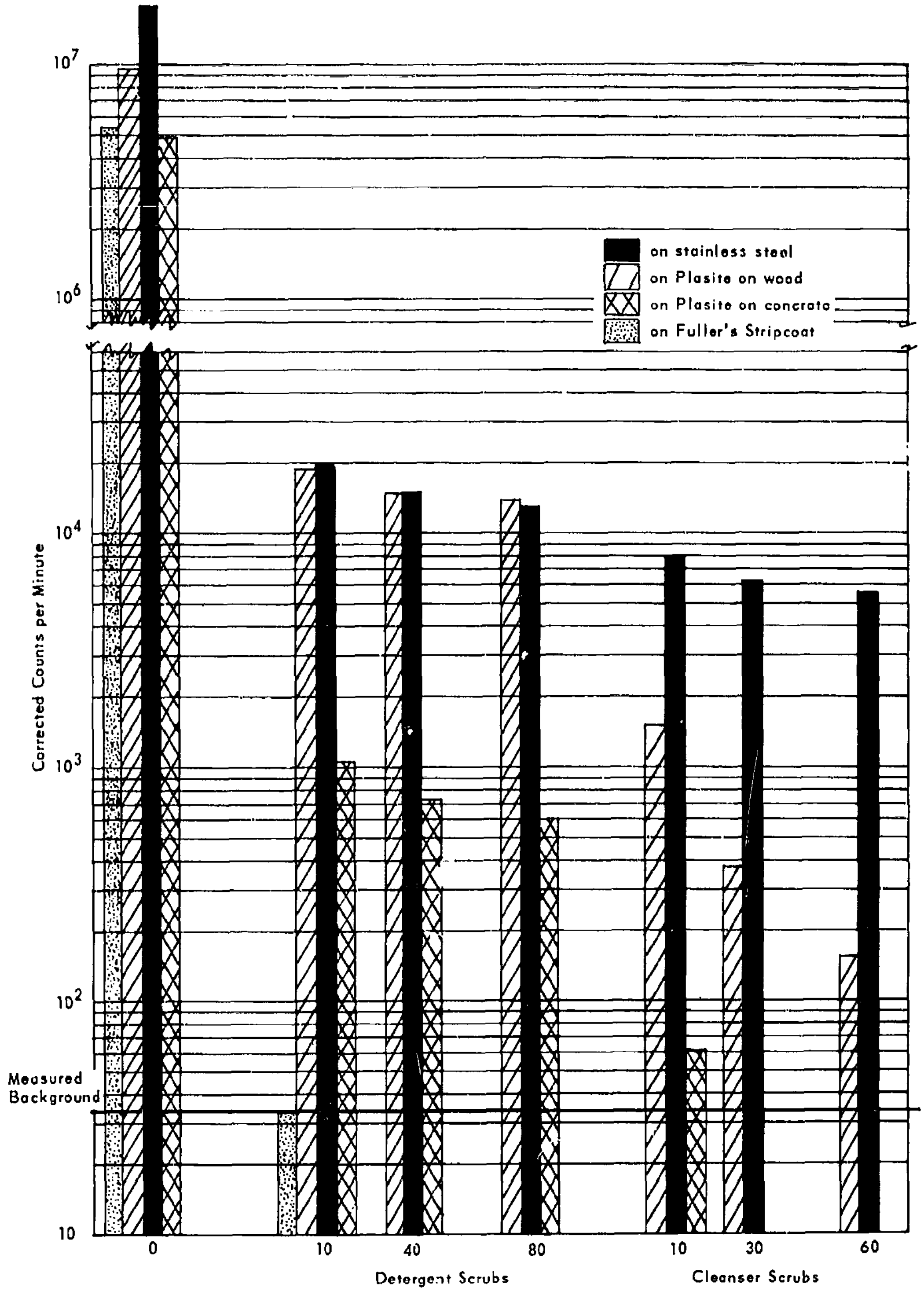

Figure 2. Contamination by aged mixed fission products.

The work reported in Reference 3 shows an increase in ease of cleaning by a factor of nearly 1,000 between stainless steel and the polyurethane coating, which was easiest to clean. The work reported here is in substantial agreement with previous reports[3,4] in that it shows an epoxy coating to be more easily cleaned of aqueous contaminants than stainless steel.

IN-SERVICE EVALUATION OF PLASITE 7122

Two laboratories at the Atomic Energy Commission's Scientific Laboratory at Los Alamos, New Mexico, were visited for the purpose of evaluating Plasite 7122 under routine use in a radioactive environment. In one laboratory, work in progress included process development for the preparation of plutonium, while americium, curium, and berkelium compounds were being worked with in the other. These two laboratories are maintained similarly.

Work is conducted in approximately 5 x 5 x 10-foot dry boxes. Some of the special-use boxes, constructed of mild steel and coated with Plasite 7122 according to the paint manufacturer's directions, have been in use for 12 years. The paint was inspected and no evidence of blistering, checking, cracking, chalking, or rusting was found. In some of the corrosive-use dry boxes, the Plasite has shown a tendency to discolor, but again no failure due to blistering, chalking, or rusting has occurred.

Flooring materials of rubber mat, vinyl tile, concrete, and steel are painted with Plasite 7122. This floor paint has held up under cloth overshoe scuffing and daily detergent-and-water mopping for approximately 2 years between repaintings.

In the event of accidental spills, decontamination is effected with an aqueous sodium citrate and soap cleaning solution and by removal of paint as necessary. Removal and replacement of steel or concrete is not found to be necessary; it is protected by the paint. After decontamination, the affected area is repainted with Plasite 7122. Due to some lot to lot differences in color, repainted areas often appear somewhat unsightly.

FINDINGS AND CONCLUSIONS

The strippable coating worked either very well or not at all, depending upon whether or not it was dissolved by the contaminant. Removal of the coating contaminated with the aqueous solution of aged mixed fission products effectively removed all of the contaminant; the tri-n-butyl phosphate dissolved the coating and the contaminated spot did not strip off, and so the coating was ineffective.

The Plasite on concrete and Plasite on wood surfaces can be cleaned of contamination by both tri-n-butyl phosphate and aged mixed fission products. These surfaces are satisfactory.

The stainless steel was easy to cleanse of tri-n-butyl phosphate and is a satisfactory surface for exposure to this contamination. It was difficult to cleanse of aged mixed fission products, and its resistance to this sort of aqueous contamination is questionable.

The Plasite 7122 brand of epoxy resin paint has been used by the Los Alamos Scientific Laboratory to coat surfaces that are routinely exposed to a radioactive environment. This activity is primarily interested in the protection against radioactive contamination afforded by this paint. Experience has shown this protection to be satisfactory.

ACKNOWLEDGMENT

Dr. L. B. Gardner of the Physics Division, NCEL, corrected the data for errors due to Geiger tube resolution, decay of radioactive samples, and background activity. He supplied the Appendix, describing the analysis of data.

Appendix

DATA ANALYSIS

All counting data was analyzed by published techniques, utilizing the computer programs PDC, DATORG, RESOL, DCISON, STAT, and DECAY. Counting data was corrected for decay back to 1200 on 3 June 1964, the time of the first observations. Correction for the background count rate of 34 counts per second was included. The same counting system (1.4-mg/cm^2 mica end-window detector and Berkeley scaler Model 2000) was used throughout. The same perpendicular distance from source to test panel was also used throughout, although the geometry cannot be said to be constant because of the possibility of spreading sample material during washing of the panels.

Two different radioactive materials were used in these experiments: aged mixed fission products and tri-n-butyl phosphate tagged with phosphorus-32. The effective half-life of the mixed fission products over the period of these experiments was separately determined to be 147 days, by following the decay of a sample evaporated on a planchet. The half-life of the tri-n-butyl phosphate was taken to be 14.5 days based on the half-life of phosphorus-32.

The variation of count rate with sample size was studied separately. In this study 1-centimeter squares were marked off around the center of the panel, and 0.1 milliliter of radioisotope was pipetted in each square. Separate panels were used for each of the two isotopes. After each successive grouping of squares around the center of the panel, beginning with four squares followed by additional encirclements or squares, the count rate was determined as a function of the perpendicular distance from the panel to the detector's window. From this data, the distance of 10 millimeters was selected for the performance of the decontamination experiments.

By separate experiment, in which the decay of a highly active sample of 9.9-minute copper^{62} was measured, the dead time of the counting system was determined to be 3.26×10^{-6} minutes.

Table I. Cleanability of Stainless Steel (corrected data)

Measurement	Average Count Rate (counts/min)	
	Mixed Fission Products Contamination	Tri-n-butyl Phosphate Contamination
Initial	17,100,000	80,400
10 detergent scrubs	19,300	40
40 detergent scrubs	15,100	
80 detergent scrubs	12,600	
10 cleanser scrubs	7,820	
30 cleanser scrubs	6,240	
60 cleanser scrubs	5,560	

Table II. Cleanability of Plasite on Concrete (corrected data)

Measurement	Average Count Rate (counts/min)	
	Mixed Fission Products Contamination	Tri-n-butyl Phosphate Contamination
Initial	4,950,000	60,600
10 detergent scrubs	1,050	1,450
40 detergent scrubs	729	1,160
80 detergent scrubs	596	1,100
10 cleanser scrubs	61	787
30 cleanser scrubs		360
60 cleanser scrubs		180

Table III. Cleanability of Plasite on Wood (corrected data)

Measurement	Average Count Rate (counts/min)	
	Mixed Fission Products Contamination	Tri-n-butyl Phosphate Contamination
Initial	9,490,000	322,000
10 detergent scrubs	18,600	1,690
40 detergent scrubs	14,900	1,330
80 detergent scrubs	13,900	1,280
10 cleanser scrubs	1,510	964
30 cleanser scrubs	377	552
60 cleanser scrubs	156	232

Table IV. Performance of Stripcoat on TT-E-489 (corrected data)

Measurement	Average Count Rate (counts/min)	
	Mixed Fission Products Contamination	Tri-n-butyl Phosphate Contamination
Initial	5,230,000	Contaminant dissolved and penetrated the Stripcoat
Stripped	34	

REFERENCES

1. H. Wells. "Decontaminable surfaces," in United Kingdom Atomic Energy Authority, Authority Health and Safety Branch report AHSB (S) R 57: Decontamination; a symposium held at Risley on 20 March 1963, pp. 1-14. Risley, Warrington, Lancashire, England, June 1963.

2. W. J. Colclough. "Methods of assessing decontaminable surfaces," in United Kingdom Atomic Energy Authority, Authority Health and Safety Branch report AHSB (S) R 57: Decontamination; a symposium held at Risley on 20 March 1963, pp. 15-26. Risley, Warrington, Lancashire, England, June 1963.

3. R. Kuninori and M. Hazue. "Radioactive contamination and decontamination of some protective coatings," Official Digest, vol. 36, no. 470, March 1964, pp. 256-267.

4. P. C. Tompkins and O. M. Bizzel. "Working surfaces for radiochemical laboratories: Glass, stainless steel, and lead," Industrial and Engineering Chemistry, vol. 42, no. 8, Aug. 1950, pp. 1469-1475; Also, P. C. Tompkins, O. M. Bizzel, and C. D. Watson, "Working surfaces for radiochemical laboratories: Paints, plastics, and floor materials," Industrial and Engineering Chemistry, vol. 42, no. 8, Aug. 1950, pp. 1475-1481.

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